# Development of Nursing Care Support System using PDA with wireless and barcode reader

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**ABSTRACT**

In this study, we developed nursing care support system using Personal Digital Assistants (PDA) with wireless and barcode reader. Our goals were to minimize the cost of deployment, to maximize the ease of operation, and to adapt to existing features and tasks of nursing care. The success of achieving these objectives was evaluated from the case study results involving system training session and trial of the system at a university hospital.

**Background**

According to a survey conducted in 2001 by the Japan Ministry of Health, Labor and Welfare, there was a shortage of 35,000 nursing staff in Japan, and the shortage expected to get worse. To compensate for this staff shortage, the use of information technology has been actively pursued in hospitals and other care facilities. However, conventional systems were difficult to introduce, and even if introduced, generally went unused because these were so expensive, required high computer literacy, and were uncomfortable with the nursing procedures. To diminate these problems, we had developed Nursing Care Support System that minimizes the cost of deployment and maximizes ease of operation.

**Methods**

Nursing tasks is carried out at bedsides and mostly involves checking and acquiring data such as vital-sign data and making entries. To ensure the mobility, we chose to use CASIO IT-500[1)] as replacement of conventional desktop-based terminals. Mitigation the risk of mistakes in certification , specifically relating to medication/injection and blood transfusion certification is required now. To make such certifications possible, we had adopted a system based with barcode reader. By integrating the server with other systems (ordering, drug management and blood transfusion management), it is possible to certify that patient and drug match, and is preventing the wrong drug from being administered. On scanning the barcode on the staff ID card, it automatically enrolls datum such as that who administered, which drug, to which patient, at what time and so on. This solved the issue of conventional search-by-name method for patient certification makes the risk that mix-ups involving patients with the same name, or drugs with similar names but completely different compositions. From the viewpoint of allowing the system to conform acquisition in real time, PDA cradle is so inconvenience to require frequent attachment and uploading data from and download to PDA. So we use wireless networking based on the IEEE 802.11b standard to real time data transmission.

Fig. 1. Input patient ID and Drug ID from barcode

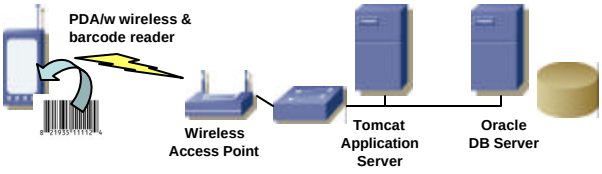


Fig.2 Automatic entry to database with barcode-reader

**Conclusion**

After a training session 97% of the attendee understood how to use the system after just 90-minutes training. (Attendees consisted of 256 members of the nursing staff of a university hospital, with 70% understanding completely, 27% understanding fairly well and 3% understanding only a little.) We had discovered that this system is so easy to foreshorten the learning curve time and are is very effective as terminals for nursing care support. We will make research the new nursing task path using the combination of mobile terminal and barcode system cause there is a report shows that the side effect may occur on bringing in bar-code system.

**References**

1. CASIO IT-500 http://www.casio.co.uk/mobility/pdfs/IT-500%20Series.pdf

2. Emily S. Patterson, PhD, Richard I. Cook, MD and Marta L. Render, MD "Improving Patient Safety by Identifying Side Effe cts from Introducing Bar Coding in Medication Administration",J AMIA 9:540-553 (2002)